

# Traulsen Refrigeration



## **SERVICE MANUAL #07**

### **Instructions For The Troubleshooting And Repair Of All Traulsen TE-Series Refrigerated Equipment Stand Models**

Traulsen's equipment stands are solely intended for use with cooking equipment.



#### **-NOTICE-**

This Manual is prepared for the use of trained Authorized Traulsen Service Agents and should not be used by those not properly qualified. This manual is not intended to be all encompassing, but is written to supplement the formal training, on-the-job experience and other product knowledge acquired by Authorized Traulsen Service Agents. Before proceeding with any work, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed only by a trained Authorized Traulsen Service Agent.

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FORT WORTH, TX.

SERIAL VOLTS	MODEL Hz	PH
TOTAL CURRENT	AMPS	
MINIMUM CIRCUIT	AMPS	
MAXIMUM OVERCURRENT PROTECTION		AMPS
LIGHTS	WATTS	
HEATERS	AMPS	
REFRIGERANT DESIGN PRESSURE	TYPE HIGH	OZ LOW
REFRIGERANT DESIGN PRESSURE	TYPE HIGH	OZ LOW

370-60294-00 REV (A)



## I. THE SERIAL TAG

The serial tag is a permanently affixed sticker on which is recorded vital electrical and refrigeration data about your Traulsen product, as well as the model and serial number. This tag is located on the upper right interior wall of all TE-Series models.

### READING THE SERIAL TAG

- Serial = The permanent ID# of your Traulsen
- Model = The model # of your Traulsen
- Volts = Voltage
- Hz = Cycle
- PH = Phase
- Total Current = Maximum amp draw
- Minimum Circuit = Minimum circuit required
- Lights = Light wattage
- Heaters = Heater amperage
- Refrigerant = Refrigerant type used
- Design Pressure = High & low side operating pressures and refrigerant charge
- Agency Labels = Designates agency listings

## II. GENERAL INFORMATION

### II. a - INTRODUCTION:

This manual applies to the following Traulsen models only:

TE036HT, TE048HT, TE060HT, TE065HT, TE072HT  
TE084HT, TE096HT, TE110HT, TE125HT &  
TE139HT

### II. b - MODEL DESIGNATIONS:

## TE060HT

Position 1: TE = Traulsen Equipment Stand

Position 2: 036 = 36" Long Model

048 = 48" Long Model

060 = 60" Long Model

Position 3: HT = Refrigerator

### II. c - WIRING DIAGRAM:

Refer to the wiring diagram for any service work performed on this unit. A copy is located on the unit when shipped. Should you require another copy, or a wiring diagram for an older production unit, please contact Traulsen Service at (800) 825-8220, and provide the model and serial number of the unit involved (this information is located on the serial tag, see page one).

### II. d - INSTALLATION:

Generally TE-Series refrigeration products are installed by the dealer, or others contracted by the dealer or owner. Detailed installation instructions are included along with each unit when shipped.

### II. e - CLEANING:

Detailed cleaning instructions are included with each unit, however special care **MUST** be given to the condenser coil. The condenser coil must be cleaned at a minimum of every six months. This can be done with a vacuum cleaner using a brush attachment, or a stiff brush or wisk broom. For more information please refer to "Section V.a" of the TE-Series Owner's Manual.

### II. f - TOOL REQUIREMENTS:

For most jobs a standard set of hand tools, a VOM and AC current tester, along with a temperature tester or thermometer are adequate. However in some cases the following additional tools may be required as well:

- Refrigeration Gauge Manifold
- Refrigeration Reclaiming Equipment
- Acetylene Torch
- Anti-Static Grounding Kit (TL 84919)
- Nitrogen Bottle With Gauges
- Thin 5/16" Open End Wrench
- Refrigerant Reclaim Unit

### II. g - REF'N SYSTEM - THEORY OF OPERATION:

The refrigeration system is the mechanism whereby heat is transferred from the cabinet to the outside air. It works under the principle that the heat moves from hot to cold as it tries to establish equilibrium.

The microprocessor control signals a need for heat to be removed from the cabinet. The compressor begins by compressing the refrigerant gas as it is discharged. The high pressure refrigerant now circulates through the condenser, removing heat from the refrigerant and condensing it into a liquid. From there the refrigerant flows to the filter drier which removes all traces of moisture and particles from the system.

After the filter drier, the refrigerant passes through a "metering device." Traulsen uses a capillary tube to regulate the flow of refrigerant into the evaporator coils.

In the evaporator coil, heat is transferred from the cabinet to the refrigerant, which changes from a cold liquid to a warm low pressure gas. When the desired cabinet air temperature has been reached, the microprocessor control shuts off the compressor.

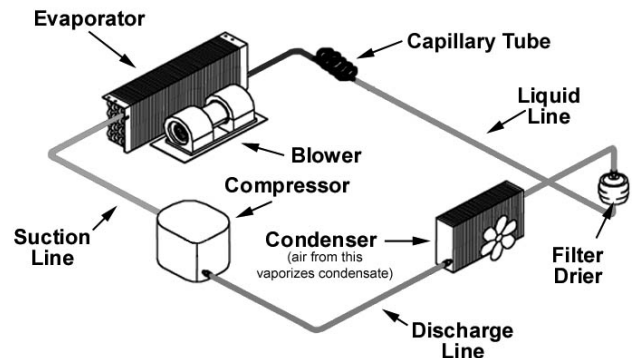


Fig. 1 - The Refrigeration System

### II. h - AIR FLOW REQUIREMENTS:

To assure optimum performance, the condensing unit of your Traulsen unit **MUST** have an adequate supply of air for cooling purposes. Therefore, the operating location must allow a minimum of 12" clearance in front of the louvers to allow for unrestricted air flow to the condensing unit.

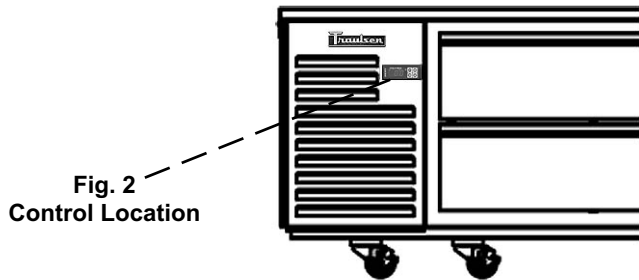
### II. i - THE MICROPROCESSOR CONTROL:

For detailed information on replacement, repair or adjustment of the INTELA-TRAUL® microprocessor control please refer to it's service manual (form number TR35705).

## II. GENERAL INFORMATION (cont'd)

### II. j - CONTROL LOCATION:

On all TE-Series refrigerator models, the micro-processor control is located on the louver assembly. The louvers/refrigeration system are mounted standard on the left side, but as an option are available mounted on the right (see figure 2).



### II. k - OPERATING DATA CHART:

**Refrigerated Models** (cabinet temperature set at 38°F)

Ambient	70°F	100°F
Suction Pressure	35 PSIG	50 PSIG
Suction Temperature	3°F	16°F
Discharge Pressure	200 PSIG	295 PSIG
Discharge Temperature	88°F	115°F

### II. l - SPECIFICATIONS:

TE-Series Refrigerated Equipment Stands			
	TE036	TE048	TE060
Horsepower	1/3 HP	1/3 HP	1/3 HP
Condensing Unit - BTU/HR	2440	2440	2440
Condensing Unit Amp Draw	4.5	4.5	4.9
Fan, Lights, Etc. Amp Draw	0.6	0.6	1.1
Refrigerant	R-404A	R-404A	R-404A
Refrigerant Charge (oz.)	14.0	14.5	16.0

TE-Series Refrigerated Equipment Stands			
	TE065	TE072	TE084
Horsepower	1/3 HP	1/3 HP	1/3 HP
Condensing Unit - BTU/HR	2440	2440	2440
Condensing Unit Amp Draw	4.9	4.9	4.9
Fan, Lights, Etc. Amp Draw	1.1	1.1	1.1
Refrigerant	R-404A	R-404A	R-404A
Refrigerant Charge (oz.)	16.5	16.5	17.0

TE-Series Refrigerated Equipment Stands			
	TE096	TE110	TE125
Horsepower	1/2 HP	1/2 HP	1/2 HP
Condensing Unit - BTU/HR	4090	4090	4090
Condensing Unit Amp Draw	9.6	9.6	9.6
Fan, Lights, Etc. Amp Draw	1.5	1.5	1.5
Refrigerant	R-404A	R-404A	R-404A
Refrigerant Charge (oz.)	20.0	20.0	20.0

TE-Series Refrigerated Equipment Stands			
	TE139		
Horsepower	1/2 HP		
Condensing Unit - BTU/HR	4090		
Condensing Unit Amp Draw	9.6		
Fan, Lights, Etc. Amp Draw	1.9		
Refrigerant	R-404A		
Refrigerant Charge (oz.)	21.0		

### III. REMOVAL & REPLACEMENT OF BASIC PARTS

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.**

#### III. a - LOUVER ASSEMBLY/SYSTEM ACCESS:

To remove the louver assembly first place your hands under the louver panel and lift this up off the bracket and then away from the cabinet face (see figure 3).

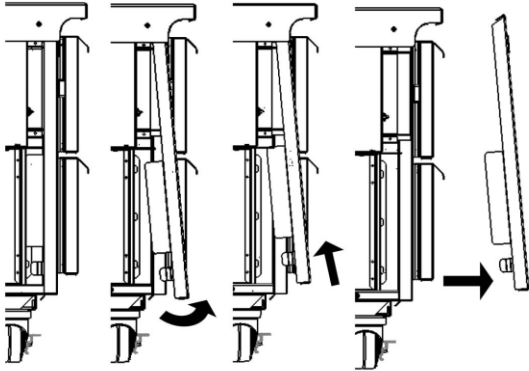


Fig. 3

To gain full access to the refrigeration system from the side, remove the cover by removing the bottom screws (see figures 4 & 5).



Fig. 4  
Screw  
Locations



Fig. 5  
Side System  
Access

When finished, lower the louver assembly into position and replace the side panel. Secure these in place using the previously removed screws.

#### III. b - EVAPORATOR HOUSING COVER:

Remove the back cover by removing the four screws which secure this to the cabinet (see figure 6).

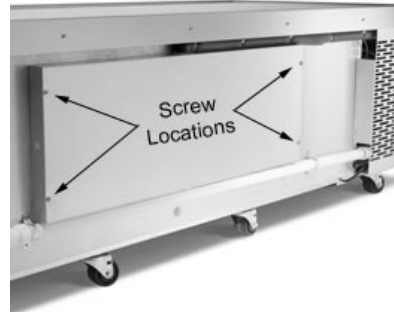


Fig. 6

Reverse the procedure when done to reinstall.

#### III. c - REMOVING THE DRAWERS:

Remove the drawer(s) from the drawer frame by lifting up on the drawer, and then pulling out.

#### III. d - REMOVING THE DRAWER FRAME:

Once the drawer(s) have been removed, the drawer frame module can also be removed by loosening the front and back clamping knobs (2 of each), located on the cross-rail and liner locks (see figures 7 & 8). Slide the front cross-rail locks towards the center of the drawer frame module and allow the liner locks to drop down from the top of the liner. Pull the drawer frame module forward, tip forward and pull out. The entire frame assembly is now free to slide out of the cabinet.

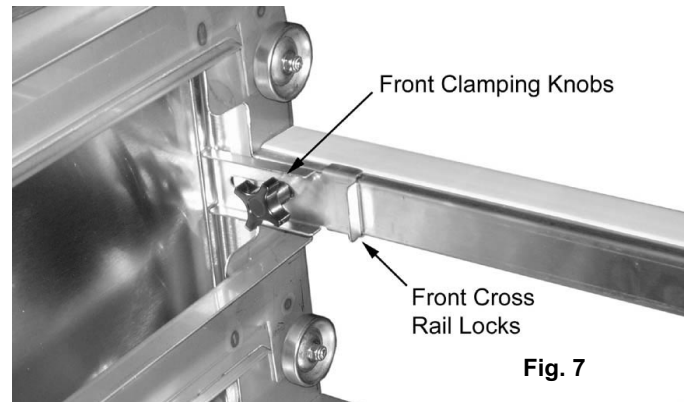


Fig. 7

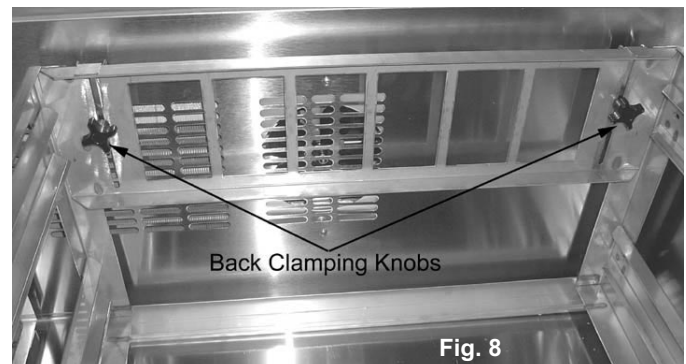


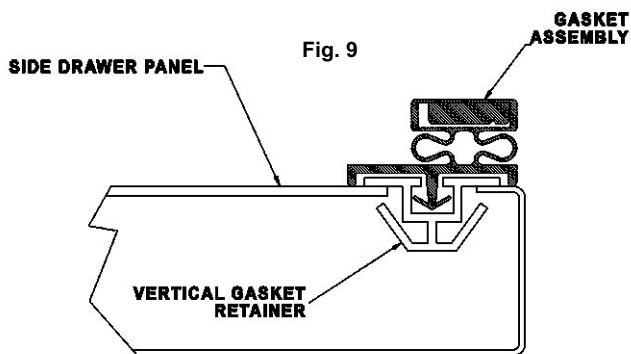
Fig. 8

### III. REMOVAL & REPLACEMENT OF BASIC PARTS (cont'd)

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.**

#### III. e - DRAWER GASKETS:

To remove the gasket to be replaced, grasp it firmly by one corner and pull it out. Before attempting to install a new gasket, both the unit and the gasket itself must be at room temperature. Insert the four corners first by using a rubber mallet (or hammer with a block of wood). After the corners are properly inserted, work your way towards the center from both ends by gently hitting with a mallet until the gasket is completely seated in place (see figure 9 for gasket cross section).



**NOTE:** The gasket may appear too large, but if it is installed as indicated above it will slip into place.

#### III. f - THE MICROPROCESSOR CONTROL:

To remove the microprocessor controller from the unit in which it was installed, please refer to section "V" of your INTELA-TRAUL® Master Service Manual.

#### III. g - DRAIN PAN:

To remove the drain pan, begin by removing the evaporator housing cover as outlined in section "III. c." Next, remove the screws and brackets which secure the drain pan, and remove the drain tube from the drain pan. Finish by sliding the drain pan out from under the coil.

Reverse the procedure to install.

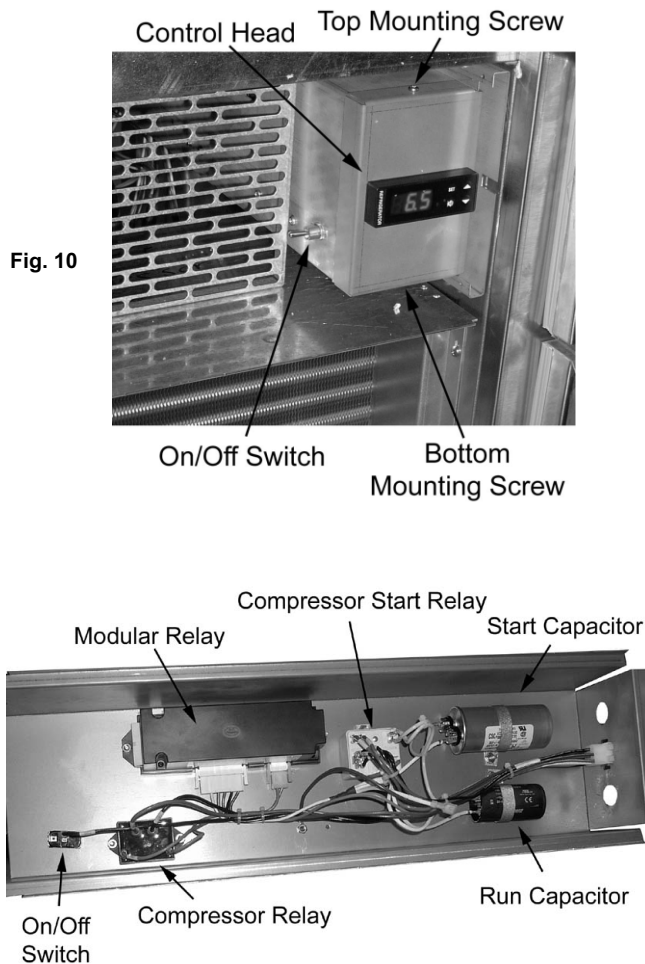
#### III. h - ACCESSING START COMPONENTS:

The start components are located behind the front louver, inside a metal tray.

To access the start components, first remove the louver assembly as shown in section III. a. Next loosen the top set screw (see figure 10). and remove the molex connection in the back of the box to gain access to the back set screw. Slide the electrical box out the front on its tracks.

See figure 11 for component detail.

#### III. h - ACCESSING START COMPONENTS (cont'd):



## IV. a - REPLACING THE CONDENSER FAN MOTOR AND/OR BLADE

**STEP 1:** Remove the louver assembly as outlined in section "III. a" to gain access through left side.

**STEP 2:** Remove the screws holding the fan motor bracket to the compressor mounting base (see illustration 1).

**STEP 3:** Remove the blade from the motor shaft by removing the nut (see illustration 2).

**NOTE:** Install the concave side of the fan blade toward the motor.

**NOTE:** If the blade is all that is being replaced, stop here and reverse procedure to install.

**STEP 4:** Remove the mounting bracket from the motor (see illustration 3).

**STEP 5:** Disconnect the lead wires at the compressor junction box.

**STEP 6:** Reverse the procedure to install.

**STEP 7:** Reconnect power to the unit.

**STEP 8:** Reset the microprocessor control defrost time settings to the correct time of day.

### **WARNINGS:**

**1) DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.**

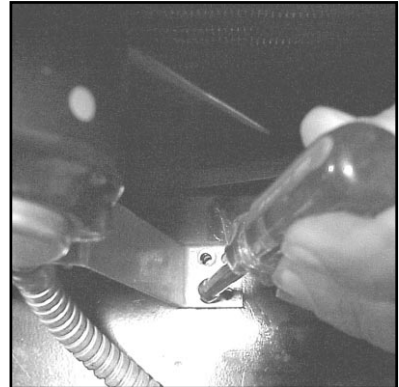


Illustration 01

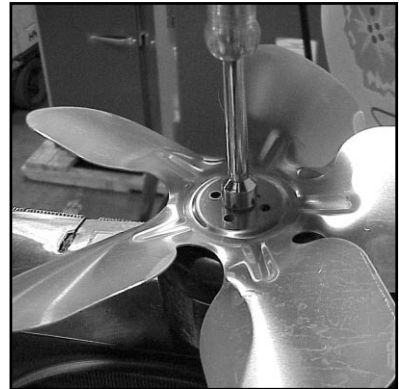


Illustration 02



Illustration 03

## IV. b - REPLACING THE CONDENSER COIL

### **WARNINGS:**

1) DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.

2) THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.

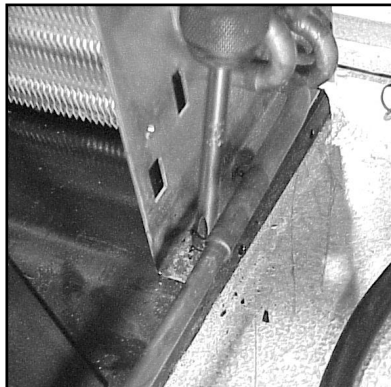


Illustration 01

**STEP 1:** Remove the louver assembly as outlined in section "III. a".

**STEP 2:** Recover the refrigerant in the system following the current EPA Guidelines for refrigerant recovery.

**NOTE:** The use of reclaiming equipment is required.

**STEP 3:** Disconnect the input and output lines to the condenser coil at the soldered joints closest to the condenser.

**STEP 4:** Remove the four (4) screws which secure the condenser coil to the mounting brackets (see illustration 1).

**STEP 5:** Remove the condenser coil.

**STEP 6:** Reverse the procedure to install the new condenser coil.

**STEP 7:** Install a new drier.

**STEP 8:** Charge the refrigeration system as outlined under "CHARGING SYSTEM" in "SERVICE PROCEDUES AND ADJUSTMENTS."

**STEP 9:** Reconnect power to the unit.

**STEP 10:** Reset the microprocessor control defrost time settings to the correct time of the day.



## IV. c - REPLACING THE EVAPORATOR FAN

**STEP 1:** Begin by removing the back cover by first removing the four screws which secure this to the cabinet (see illustration 1).

All evaporators and fans are located along the back wall of the cabinet and best accessed from the rear (see illustration 2).

**STEP 2:** Remove the holding rod and unhook the rod from the other end. This evaporator fan can then be lifted away from the assembly (see illustration 3).

**STEP 3:** Disconnect the wires from the assembly.

**STEP 4:** Reverse the procedure to install the new evaporator fan.

**STEP 5:** Reconnect power to the unit.

**STEP 6:** Reset the microprocessor control defrost time settings to the correct time of the day.

### **WARNINGS:**

1) **DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.**

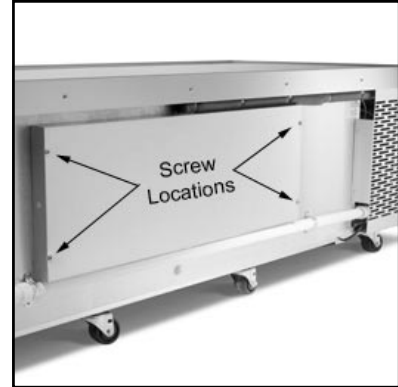


Illustration 01

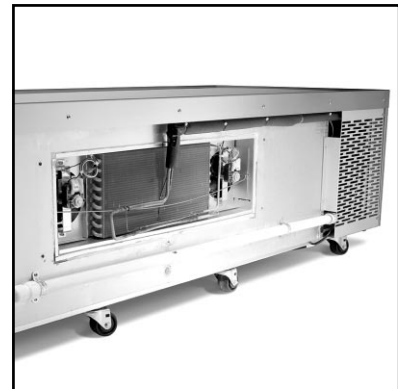


Illustration 02

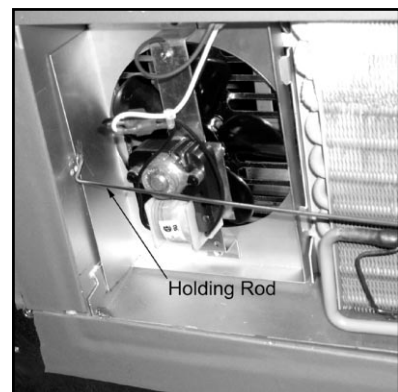


Illustration 03

## IV. d - REPLACING THE EVAPORATOR COIL

### **WARNINGS:**

1) DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.

2) THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.

**STEP 1:** Remove evaporator housing cover as outlined in section "III. b".

**STEP 2:** Recover the refrigerant in the system following the current EPA Guidelines for refrigerant recovery.

**NOTE:** The use of reclaiming equipment is required.

**STEP 3:** Remove the screws which secure the evaporator to the mounting brackets.

**STEP 4:** Disconnect the evaporator output line.

**STEP 5:** Unsolder the liquid line leading into the capillary tube.

**NOTE:** When removing the capillary tube care must be taken to heat protect. Heat sink or wrap a cold, damp cloth over the capillary tube to protect it from overheating.

**NOTE:** Inspect the end of the liquid line after disassembly, it could become plugged with solder.

**STEP 6:** Remove the evaporator coil and capillary tube from the unit.

**STEP 7:** Reverse the procedure to install the new evaporator coil and capillary tube.

**STEP 8:** Install a new drier.

**STEP 9:** Charge the refrigeration system as outlined under "CHARGING SYSTEM" in "SERVICE PROCEDUES AND ADJUSTMENTS."

**STEP 10:** Reconnect power to the unit.

**STEP 11:** Reset the microprocessor control defrost time settings to the correct time of day.

## IV. e - REPLACING THE COMPRESSOR

**NOTE:** Compressor models will vary with each cabinet model, but the basic removal instructions can be followed.

**STEP 1:** Recover the refrigerant in the system following the current EPA Guidelines for refrigerant recovery.

**NOTE:** The use of reclaiming equipment is required.

**STEP 2:** Remove the compressor junction box cover.

**STEP 3:** Disconnect all wire leads coming into the junction box.

**STEP 4:** Disconnect the discharge and suction lines to the compressor (see illustration 1).

**STEP 5:** Remove the compressor which is secured by either four (4) nuts or pins.

**STEP 6:** Install the new compressor and connect the input and output lines.

**STEP 7:** Connect the lead wires at the junction box.

**STEP 8:** Install a new drier.

**STEP 9:** Charge the refrigeration system as outlined under "CHARGING SYSTEM" in "SERVICE PROCEDUES AND ADJUSTMENTS."

**STEP 10:** Reconnect power to the unit.

**STEP 11:** Reset the microprocessor control defrost time settings to the correct time of day.

### **WARNINGS:**

1) DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT/TAGOUT PROCEDURES.

2) THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.

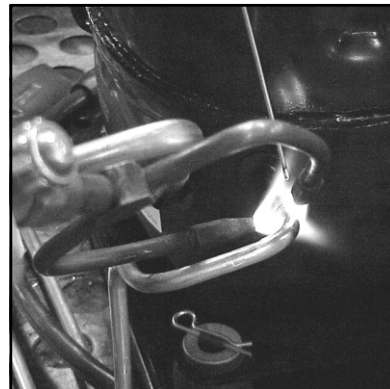
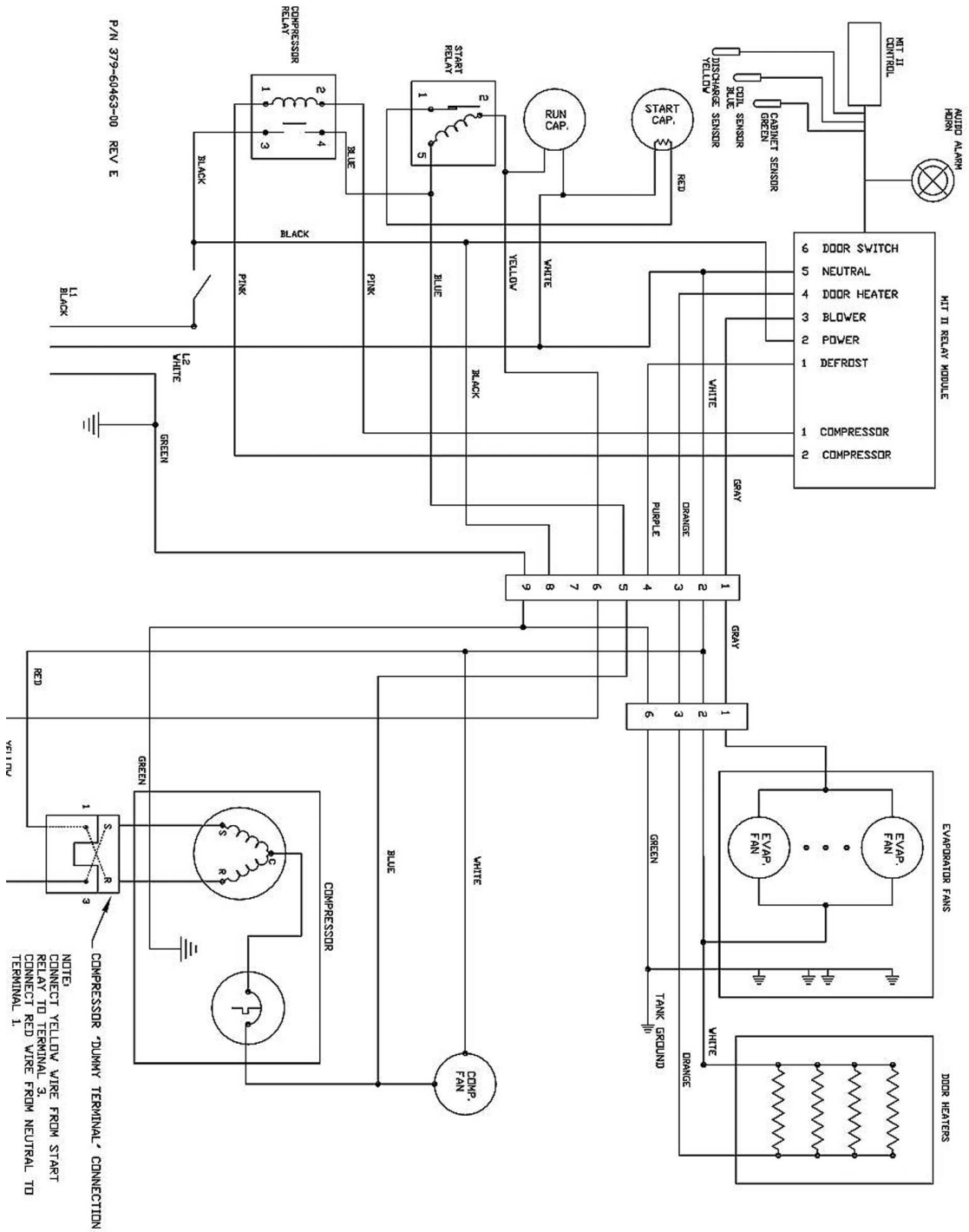


Illustration 01

# V. WIRING DIAGRAM



## VI. SERVICE PROCEDURES & ADJUSTMENTS

**WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.**

### VI. a - SYSTEM ACCESS:

All external indicators should be checked as part of system diagnosis before determining the refrigerant pressures. Improper access may expose the refrigerant to contaminants and non-condensables which will result in system failure.

### VI. b - SWEAT-ON PIERCING VALVES:

**NOTE:** Sweat-on piercing valves are used for system diagnostics, but may be left on after service is complete. They may be installed while the system is fully charged.

- 1) Place one piercing valve on the compressor process tube and one on the liquid line process tube. Follow the installation instructions provided by the manufacturer of the piercing valve.
- 2) When complete, follow the guidelines as outlined under "LEAK CHECK" and "EVACUATING SYSTEM."

### VI. c - REFRIGERANT LEAK CHECK:

**DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.**

**NOTE:** The use of R-22 in small quantities is recommended as a trace gas for leak detection.

**NOTE:** This leak check procedure is to be used only after the refrigerant has been properly reclaimed.

- 1) Access the refrigeration system (note: see section "V. a - SYSTEM ACCESS").
- 2) Attach gauge manifold set to the system, low side to process tube on the compressor and the high side to the process tube.
- 3) Connect refrigerant bottle to the center of gauge manifold and open the valve on the bottle. Bleed charging hose at the manifold gauge to remove air from the system.
- 4) Open valve on low side of gauge manifold and charge system with one ounce of R-22.
- 5) Close low side valve on gauge manifold and the valve on the refrigerant bottle.
- 6) Disconnect refrigerant bottle and connect nitrogen bottle.

### VI. c - REFRIGERANT LEAK CHECK (cont'd):

**NOTE:** The use of a nitrogen regulator is required.

- 7) Set output valve on nitrogen valve to 120 psi.
- 8) Open nitrogen bottle valve and low side gauge manifold valve. Allow pressure to equalize.
- 9) Shut off both valves and disconnect nitrogen bottle.
- 10) Use a leak detector or a thick soapy solution and check for leaks at all tubing connections.

**A -** If leaks are found, repair leaks and repeat process.

**B -** If no leaks are found, evacuate system as outlined in section "V. d - EVACUATING SYSTEM").

- 11) Charge the system by weighing in the exact charge and check for proper operation.

### VI. d - EVACUATING SYSTEM:

**Introduction -** Refrigeration reclaiming equipment is required. Our goal in system evacuation is to remove all the non-condensables possible. No evacuation method will remove 100% of the moisture and air from within the refrigeration circuit. Because of this, guidelines and methods must be developed and adhered to ensuring only harmless amounts of contaminants remain in the system.

#### GUIDELINES

**WARNING - DO NOT PRESSURIZE SYSTEM ABOVE 150 PSIG. PRIOR TO EVACUATION OR DURING LEAK TEST PROCEDURES.**

- Use only a two stage vacuum pump (2 CFM or greater) and electronic micron.
- Evacuate from high and low sides of the system.
- No chemical additive or alcohols are to be used to "dry up" a system.
- Blow down of system with DRY NITROGEN prior to evacuation is acceptable and many times desirable. See "System Clean-Up."
- Evacuate to 200 microns.

#### PROCEDURE

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**WARNING: THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.**

## VI. SERVICE PROCEDURES & ADJUSTMENTS (cont'd)

**WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.**

### VI. d - EVACUATING SYSTEM/GUIDELINES (cont'd):

- 1) Access the refrigeration system as outlined under "SYSTEM ACCESS."
- 2) Connect low (blue) side of gauge manifold to schrader valve on compressor process line and high (red) side of gauge manifold to schrader valve on filter/drier process line.
- 3) Connect center line of gauge manifold to vacuum pump.
- 4) Turn vacuum pump on and open both sides of gauge manifold.
- 5) Pull a vacuum to 200 microns.
- 6) Break the vacuum with 3 psig of dry nitrogen.
- 7) Repeat steps 5 and 6.
- 8) Pull vacuum to 200 microns.
- 9) Charge system and check for proper operation.

### VI. e - CHARGING SYSTEM:

**WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AT THE MAIN CIRCUIT BOX. PLACE A TAG ON THE CIRCUIT BOX INDICATING THE CIRCUIT IS BEING SERVICED.**

**WARNING: THIS PROCEDURE REQUIRES THE USE OF REFRIGERANTS. BE CERTAIN THE WORK AREA IS WELL VENTILATED. SAFETY GOGGLES AND GLOVES SHALL BE WORN SINCE REFRIGERANTS MAY CAUSE BURNS TO THE SKIN.**

- 1) Access the refrigeration system.
  - 2) Attach gauge manifold set to system, low side to process tube on the compressor and the high side to the process tube on the drier.
- NOTE: See "SYSTEM ACCESS."**
- 3) Be sure the system is properly leak checked and evacuated before charging as outlined under "LEAK CHECK" and "EVACUATING SYSTEM."
  - 4) Make certain both valves are closed on the gauge manifold. Open the valve on the bottle. Bleed charging hose at the manifold gauge to remove air.

**NOTE: Initially charge system through high side to prevent liquid refrigerant from reaching compressor.**

- 5) Open the high side gauge valve (red). Allow refrigerant to flow into the system until the nameplate charge is reached or until the high side will not accept any more refrigerant. At this point, shut the gauge and bottle valves.
- 6) Reconnect power to the unit and check for proper operation and high pressure leaks.

### VI. e - CHARGING SYSTEM (cont'd):

- 7) Add the remaining amount of refrigeration charge through the low side with the compressor running.
- 8) Check for proper operation and leaks.
- 9) Disconnect power to the unit and replace any covers removed.

### VI. f - SYSTEM CLEAN UP/INTRODUCTION:

When a compressor burn-out or moisture infiltration is encountered, the service person must make the determination as to the degree of system contamination. Normally a compressor burn-out will fit into one of three categories:

- **CONTAINED** - compressor oil not acidic, no oil discoloration.
- **CONTAMINATED COMPRESSOR** - oil acidic, discoloration of oil, contamination limited to compressor.
- **MASSIVE CONTAMINATION** - contaminated oil and/or refrigerant pumped through system.

#### CONTAINED

- 1) Replacement of liquid line drier.
- 2) Install suction filter drier for clean up and then remove it when service is complete. Usually within 48-hours.
- 3) Replacement of compressor.
- 4) Evacuation (to 200 microns).
- 5) Charge by weight.

#### CONTAMINATED COMPRESSOR

The "contaminated compressor" requires the same procedure as the "contained" burn-out. Plus, the system must be flushed with nitrogen after the compressor and drier has been removed.

## VI. SERVICE PROCEDURES & ADJUSTMENTS (cont'd)

**WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.**

### VI. f - SYSTEM CLEAN UP/INTRODUCTION (cont'd):

#### MASSIVE CONTAMINATION

The replacement compressor **MUST NOT** be installed until after system clean-up procedures have been completed.

- 1) Remove the burned-out compressor as outlined under "COMPRESSOR" in "Section IV. f".
- 2) Remove the capillary tube metering device.
- 3) Purge nitrogen through the high and low sides of system until moisture and contaminated oil has been removed from the remaining components of the system.
- 4) Reassemble refrigeration system and add a CW style liquid drier and a suction line drier.
- 5) Purge nitrogen through the high and low sides of system for 5 minutes.
- 6) Evacuate refrigeration as outlined under "EVACUATING SYSTEM" for 30 minutes. Repeat nitrogen purge and evacuate two more times.
- 7) Charge system as outlined under "CHARGING SYSTEM". Allow for the increased liquid capacity of the liquid line drier.
- 8) Reconnect power and check for proper operation.
- 9) Disconnect power and install any panels removed.

### MASSIVE CONTAMINATION (cont'd):

- 10) Return between 24 and 48 hours to recover gas, replace liquid line drier with a CW style drier. Remove the suction drier, but do not replace.
- 11) Evacuate and charge system as outlined under "EVACUATING SYSTEM" and "CHARGING SYSTEM".

### VI. g - HEATER TEST - DRAWER PERIMETER HEATER:

- 1) Access the heater wire around the drawer frame.
- 2) Plug the unit in and verify 120 volt supply to the heater.
- 3) The reading should be .25 amp.

## VII. ELECTRICAL OPERATION

### VII. a - NORMAL OPERATION:

1. Conditions
  - a) Unit connected to correct voltage (check using a volt meter).
  - b) Microprocessor off cycle defrost settings correct.
  - c) Condensing unit controlled by the microprocessor control.
  - d) Cabinet at desired temperature.
  - e) Door perimeter heaters are powered 100% of the time as preset by the factory (this can be adjusted using the microprocessor control).
  - f) Evaporator fan powered.
  - g) Microprocessor control operating correctly.
2. Cabinet temperature rises above set temperature.
  - a) Microprocessor control initiates compressor operation.
  - b) Evaporator fan should be ON all the time.
3. Set temperature is met.
  - a) Conditions return to those outlined in step 1.

### VII. b - DEFROST MODE:

1. Conditions
  - a) Unit operating in normal mode.
2. Defrost initiated by the microprocessor control (an off-cycle defrost should occur every 60-minutes).
3. Defrost terminated by either: 1) Evaporator Coil Temperature or 2) Maximum Set Time Interval.
4. Cabinet returns to normal operation.
  - a) Temperature controlled by the microprocessor control.
  - b) Evaporator fan stays ON, evaporator coil will reach desired temperature.

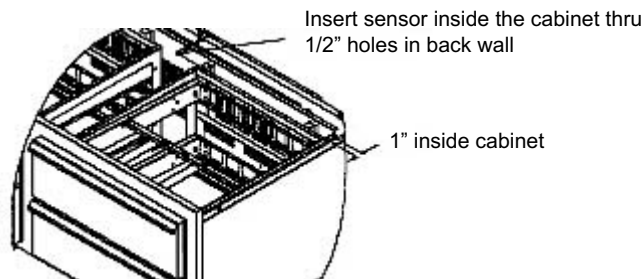
## VII. ELECTRICAL OPERATION

### VII. c - COMPONENT FUNCTION:

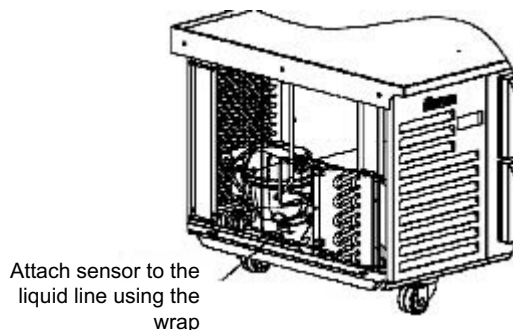
Compressor:	Pumps refrigerant thru refrigeration system components and compresses the low pressure vapor into high pressure vapor.
Condenser Fan:	Draws air across condenser coil to aid in removing heat from the refrigerant and moves air across compressor to aid in cooling the compressor.
Evaporator Fan:	Draws air from the cabinet and pulls the air thru the evaporator coil.
Start Capacitor:	Stores electrical charge which helps start the compressor motor.
Run Capacitor:	Helps keep the compressor motor running after starting.
Microprocessor Control:	Performs the functions of the 1) defrost timer, 2) high limit switch, 3) thermometer and 4) thermostat.
Drawer Perimeter Heater:	Heats drawer opening to prevent condensation from forming.
Contact Relay:	Controls voltage to compressor motors.

### VII. d - INSTALLATION OF THE SENSORS:

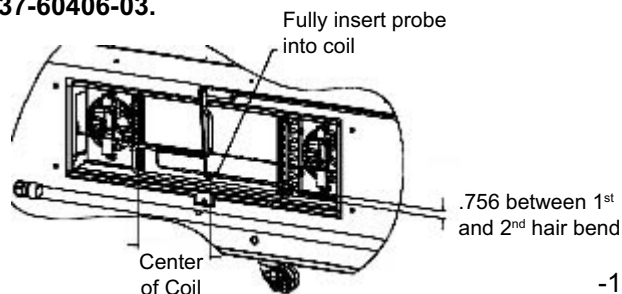
There are two sensors used inside the cabinet. The first one is the Cabinet Sensor that is used to cycle the compressor on and off at the correct temperature. The cabinet sensor is mounted between the two coils just below the top of the cabinet thru the 1/2" holes in the back wall and the tip should be 1" inside the cabinet. Refer to the drawing below. The part number for the Cabinet Sensor is 337-60405-03.



The third sensor used is a Liquid Line Sensor. This sensor is to be installed on the liquid line as it comes out of the condenser coil. The part number for this sensor is 337-60407-01.



The Evaporator Coil Sensor is to be mounted in the evaporator, in the center of the coil and fully inserted into the coil until only the wire is visible and then pinch the fins around the cable to hold it in place. The part number for the Evaporator Coil Sensor is 337-60406-03.



When the condensing temperature reaches 140°F or greater the control will display "CLN-FIL." Should the condensing temperature increase to 160°F the compressor will automatically shut off. When the liquid line temperature drops below 140°F the compressor will restart and when the line temperature drops to 120°F the alarm will reset.



## VIII. REPLACEMENT PARTS LISTING

**NOTE: Part numbers listed are for standard products as currently manufactured. For products manufactured as other than standard, or for older production units, please contact the factory.**

<u>PART NO.</u>	<u>NAME OF PART</u>	<u>PART NO.</u>	<u>NAME OF PART</u>
<u>CABINET SUPPORTS</u>		<u>COMPRESSORS</u>	
SER-60536-00	4" High Caster w/o Lock	321-60225-00	For Models TE036HT thru TE084HT
SER-60536-01	4" High Caster with Lock	321-60226-00	For Models TE096HT thru TE139HT
<u>DRAWER PARTS</u>		<u>MISC. SYSTEM COMPONENTS</u>	
(models TE036HT & TE065HT)		323-60088-00	Suction Heat Exchange Evap 9" Coil
550-10053-00	Drawer Assembly	350-10000-00	Suction Heat Exchange Evap 18" Coil
550-10057-00	Drawer Face	322-60048-00	Evaporator Coil 9"
550-10059-00	Drawer Frame	322-60050-01	Evaporator Coil 18"
SER-60537-00	Drawer Frame Insert	325-60103-00	Liquid Line Drier
341-60176-02	Drawer Gasket	325-60144-00	Condenser Fan Motor Assembly
344-60155-00	Drawer Roller	325-60145-00	Evaporator Fan Motor Assembly
<u>DRAWER PARTS</u>		325-60135-00	Condenser Fan Blade
(all models except TE036HT, TE060HT, TE065HT, TE125HT & TE072HT)		338-60050-00	Condenser Fan Motor
550-10054-00	Drawer Assembly	701-61119-00	Spring Rod 9" Evaporator Coil
550-10058-00	Drawer Face	701-61119-01	Spring Rod 18" Evaporator Coil
550-10060-00	Drawer Frame	337-60360-01	Compressor Relay
SER-60537-01	Drawer Frame Insert		
341-60176-03	Drawer Gasket	<u>MISC. CABINET PARTS</u>	
344-60155-00	Drawer Roller	337-60346-00	ON/OFF Power Switch
<u>DRAWER PARTS</u>		509-50118-00	Marine Top for TE036HT
(models TE060HT & TE125HT)		509-50118-01	Marine Top for TE048HT
550-10067-00	Drawer Assembly	509-50118-02	Marine Top for TE060HT
550-10076-00	Drawer Face	509-50118-03	Marine Top for TE065HT
550-10077-00	Drawer Frame	509-50118-04	Marine Top for TE072HT
SER-60537-03	Drawer Frame Insert	509-50118-05	Marine Top for TE084HT
341-60176-04	Drawer Gasket	509-50118-06	Marine Top for TE096HT
344-60155-00	Drawer Roller	509-50118-07	Marine Top for TE110HT
<u>DRAWER PARTS</u>		509-50118-08	Marine Top for TE125HT
(model TE072HT only)		509-50118-09	Marine Top for TE139HT
550-10074-00	Drawer Assembly	<u>LOUVER PANELS</u>	
550-10069-00	Drawer Face	500-70075-00	For System on Left
550-10070-00	Drawer Frame	500-70075-01	For System on Right
SER-60537-02	Drawer Frame Insert	<u>CONTROL PARTS</u>	
341-60176-01	Drawer Gasket	337-60403-00	Control Head
344-60155-00	Drawer Roller	337-60405-03	Cabinet Temp Sensor
		337-60406-03	Coil Temp Sensor
		337-60407-01	Liquid Line Sensor
		337-60317-00	Relay Module

## IX. TROUBLESHOOTING

**WARNING:** CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL AND REFRIGERATION SYSTEM TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

Compressor will not run, compressor has no current draw.	<ol style="list-style-type: none"> <li>1. Main circuit breaker open.</li> <li>2. Compressor overload tripped.</li> <li>3. Cabinet temperature satisfied.</li> <li>4. Wired wrong or faulty connection.</li> <li>5. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> <li>6. Start component malfunction.</li> <li>7. Compressor motor windings open.</li> </ol>
Compressor will not run, current draw and trips overload.	<ol style="list-style-type: none"> <li>1. Low voltage.</li> <li>2. Start component malfunction.</li> <li>3. Compressor windings shorted.</li> <li>4. Locked rotor.</li> <li>5. Excessive discharge pressure.</li> </ol>
Compressor short cycles on overload.	<ol style="list-style-type: none"> <li>1. Low voltage.</li> <li>2. Low refrigerant charge.</li> <li>3. Dirty condenser coil and/or filter.</li> <li>4. Wired wrong or faulty connection.</li> <li>5. Condenser fan inoperative.</li> <li>6. Run capacitor malfunction.</li> <li>7. Start component malfunction.</li> <li>8. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> <li>9. High head pressure.</li> </ol>
Compressor short cycles.	<ol style="list-style-type: none"> <li>1. Improper air flow over evaporator coil.</li> <li>2. Low ambient conditions.</li> <li>3. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> <li>4. Bad sensors.</li> <li>5. Temp differential set too close.</li> </ol>
Continuous unit operation.	<ol style="list-style-type: none"> <li>1. Loss of refrigerant.</li> <li>2. Excessive drawer openings.</li> <li>3. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> <li>4. Broken compressor valves.</li> <li>5. Very dirty condenser and/or filter.</li> <li>6. Check the "DL," if higher than 160F</li> </ol>
Compressor run time lengthy.	<ol style="list-style-type: none"> <li>1. Partial loss of refrigerant.</li> <li>2. High ambient conditions.</li> <li>3. Dirty condenser coil or improper air flow over condenser coil.</li> <li>4. Excessive product load.</li> <li>5. Excessive drawer openings.</li> <li>6. Drawer gasket requires replacement.</li> <li>7. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> <li>8. Contaminates in refrigeration system.</li> <li>9. Compressor valve leakage.</li> <li>10. Inadequate defrost cycle.</li> </ol>
Low suction pressure.	<ol style="list-style-type: none"> <li>1. Capillary tube restricted.</li> <li>2. Drier plugged.</li> <li>3. Loss of refrigerant.</li> <li>4. Poor air flow.</li> <li>5. Iced evaporator coil.</li> </ol>
High head pressure.	<ol style="list-style-type: none"> <li>1. Improper air flow across condenser.</li> <li>2. High ambient conditions.</li> <li>3. Overcharge of refrigerant.</li> <li>4. Air in system.</li> <li>5. Dirty condenser coil.</li> </ol>
Will not defrost or inadequate defrost.	<ol style="list-style-type: none"> <li>1. Defrost heater malfunction.</li> <li>2. Wired wrong or faulty connection.</li> <li>3. Cabinet air leak.</li> <li>4. Coil sensor failure.</li> <li>5. INTELA-TRAUL® control malfunction<sup>1</sup>.</li> </ol>
Coil icing.	<ol style="list-style-type: none"> <li>1. Number of defrost cycles too few.</li> <li>2. Defrost duration too short.</li> <li>3. Cabinet air leak.</li> <li>4. Drain tube plugged.</li> <li>5. Defrost heater not working.</li> <li>6. Non-frozen product put into cabinet.</li> <li>7. Coil sensor failure.</li> </ol>
The cabinet & coil sensors show high temperature.	<ol style="list-style-type: none"> <li>1. Sensor needs replacing (place sensor tip and thermometer in ice water. Change sensor ir readings differ, or if sensor displays -40 02 266).</li> </ol>



For More Information On The Proper Installation, Use and Maintenance Of Traulsen Refrigerated Equipment Stand Models, Please Refer To The Following Materials Available From Your Local Hobart/Traulsen Sales & Service Location:

- **INTELA-TRAUL Master Service Manual - Form Number TR35705**

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**For Questions Regarding Repair or Warranty Service, Please Contact Traulsen Service At:  
(800) 825-8220, ext. 6509**

**HOURS OF OPERATION:**

Monday thru Friday 7:30 am - 4:30 pm CST



Quality Refrigeration

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